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09/905,157	07/12/2001	Nathan S. Lewis	CIT1270-1	2732
41790	7590	04/17/2006	EXAMINER	
BUCHANAN INGERSOLL LLP (INCLUDING BURNS, DOANE, SWECKER & MATHIS) P.O. BOX 1404 ALEXANDRIA, VA 22313-1404			DOTY, HEATHER ANNE	
			ART UNIT	PAPER NUMBER
			2813	

DATE MAILED: 04/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/905,157

Applicant(s)

LEWIS ET AL.

Examiner

Heather A. Doty

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– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,4-8,13,16-27,31-41 and 44-54 is/are pending in the application.
- 4a) Of the above claim(s) 6-8,18-20 and 31-40 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,4,5,13,16,17,21-27,41 and 44-54 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/14/2006 has been entered.

### ***Claim Rejections - 35 USC § 112***

Applicant's amendment to claim 1 has overcome the rejections made under 35 U.S.C. 112, first and second paragraphs. The rejections are therefore withdrawn.

### ***Claim Objections***

Claim 41 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The limitation of claim 41, that the monocrystalline silicon-containing material surface is a hydrogen-terminated surface, is already included in independent claim 13.

Claim 54 is objected to because of the following informalities:

Claim 54 recites the limitation "the electrical property" in line 6. There is insufficient antecedent basis for this limitation in the claim. Appropriate correction is required.

**Claim Rejections - 35 USC § 102**

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless – (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 13, 16, 17, 21, 25-27, 41, and 49-53 are rejected under 35 U.S.C. 102(b) as being anticipated by Linford et al. (U.S. 5,429,708).

Regarding claims 13 and 16, Linford discloses a semiconductor substrate comprising providing an, *inter alia*, monocrystalline silicon-containing material **12** (col. 1, lines 17-21) having a porosity of not more than 30% (nonporous monocrystalline silicon-containing material has a porosity of less than 30%), H-terminated (abstract; col. 1, lines 17-21), and having a surface **40** substantially free of oxidation (as shown in Figs. 2A, 2B, 3, etc.; and as stated at col. 2, lines 6-45); and forming an organic monolayer—further limited by claim 16—**44, 45, 46** having more than half of its atoms being carbon and hydrogen (because R is, *inter alia*, alkyl, alkenyl, aryl, cycloalkyl...." (col. 5, lines 5-13) which are 100% carbon and hydrogen), wherein the organic layer is chemically bonded to the surface **10, 30, 32, 38** of the silicon-containing material **12** (col. 2, lines 6-45), and wherein an electrical property of the electrical structure is altered and/or improved compared to a same substrate without the organic layer, as indicated by Linford (col. 1, lines 21-31; paragraph bridging cols. 8-9; all figures).

For example, Linford states in the paragraph bridging cols. 8-9,

"For example, such molecular layers are suitable for use with: silicon based, micromechanical devices to minimize stiction; **electrode surfaces to optimize their electrochemical properties** for use in fuel cells or

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**electrochemical synthetic cells; solar cells as an antioxidation coating, silicon chips as a monomolecular photoresist, and Si-based chemical sensors to alter the electrical properties of the underlying Si."**  
(Emphasis added.)

The word "optimization," by definition, is to improve, and the word "alter" is a synonym of the word "change." Accordingly, Linford expressly and inherently teaches both changing and improving the electrical properties of the semiconductor substrate.

It is seen to be inherent that the organic layer of Linford changes the electrical property of the silicon-containing material, wherein the electrical properties are selected from a group consisting of surface recombination velocity, carrier lifetime, electronic efficiency, voltage, contact resistance, and resistance of a doped region, in addition to those regarding the carrier lifetime—further limited by claims 49-53. Evidence is the admission of Applicant in the instant specification (for example at p. 7, paragraph 0031 and paragraph 0056, bridging pp. 15-16).

See *In re Swinhart*, 169 USPQ 226,229 (CCPA 1971) (where the Patent Office has reason to believe that a functional limitation asserted to be critical for establishing novelty in the claimed subject matter may, in fact, be an inherent characteristic of the prior art, it possesses the authority to require the applicant to prove that subject matter shown to be in the prior art does not possess the characteristics relied on) and *In re Fitzgerald*, 205 USPQ 594 (CCPA 1980) (the burden of proof can be shifted to the applicant to show that subject matter of the prior art does not possess the characteristic relied on whether the rejection is based on inherency under 35 U.S.C. 102 or obviousness under 35 U.S.C. 103).

Note that as long as there is evidence of record establishing inherency, failure of those skilled in the art to contemporaneously recognize an inherent property, function or ingredient of a prior art reference does not preclude a finding of anticipation. *Atlas Powder Co. v. IRECO, Inc.*, 190 F.3d 1342, 1349, 51 USPQ2d 1943, 1948 (Fed. Cir. 1999). (Two prior art references disclosed blasting compositions containing water-in-oil emulsions with identical ingredients to those claimed, in overlapping ranges with the claimed composition. The only element of the claims arguably not present in the prior art compositions was "sufficient aeration . . . entrapped to enhance sensitivity to a substantial degree." The Federal Circuit found that the emulsions described in both references would inevitably and inherently have "sufficient aeration" to sensitize the compound in the claimed ranges based on the evidence of record (including test data and expert testimony). This finding of inherency was not defeated by the fact that one of the references taught away from air entrapment or purposeful aeration.). See also *In re King*, 801 F.2d 1324, 1327, 231 USPQ 136, 139 (Fed. Cir. 1986); *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 782, 227 USPQ 773, 778 (Fed. Cir. 1985).

In the decision in *Toro Co. v. Deere & Co.*, 69 USPQ2d 1584 (CA FC 2004), at page 1590, last paragraph, it was held that if "one or more embodiments -- whatever the settings of their operational features -- [] necessarily include or result in the subject matter of [the] limitation," then inherent anticipation of the limitation exists.

Regarding claim 17, the organic layer is a polymer **46** (Fig. 12; col. 5, lines 37-45).

Regarding claim 21, the organic layer is formed by activating the surface of the silicon-containing material; and reacting the activated surface with a chemical, wherein during the reaction, a hydrocarbon group becomes chemically bonded to the silicon-containing material (col. 2, lines 6-45).

Regarding claim 25, the hydrocarbon is an allyl, called "alkenyl" and structurally described as " $\text{-C(R)=CH(R')}$ " for example, in Linford (col. 5, lines 5-34).

Regarding claim 26, a polymer is formed by reaction with the surface-bound allyl group (col. 5, lines 37-46; paragraph bridging cols. 5 and 6).

Regarding claims 27 and 53, the hydrocarbon group is an alkoxide group (col. 4, lines 44-49; Fig. 5).

Regarding claim 41, Linford uses a hydrogen-terminated silicon surface prior to forming the organic layer (abstract; col. 1, lines 17-21).

Regarding claims 49-52, Linford teaches a methylated surface (col. 8, lines 9-15), an ethylated surface (alkyl with 2 carbons and 5 hydrogens), and a hexylated surface (alkyl with 6 carbons and 13 hydrogens—column 5, line 7).

Claim 54 is rejected under 35 U.S.C. 102(b) as being anticipated by Linford et al. (U.S. 5,429,708).

Regarding claim 54, Linford discloses a semiconductor substrate comprising providing an, *inter alia*, monocrystalline or porous silicon-containing material **12** (col. 1, lines 17-21) having a surface **40** substantially free of oxidation (as shown in Figs. 2A, 2B, 3, etc.; and as stated at col. 2, lines 6-45); and forming an organic monolayer (**44**, **45**, **46**) having more than half of its atoms being carbon and hydrogen (because R is,

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*inter alia*, alkyl, alkenyl, aryl, cycloalkyl...." (col. 5, lines 5-13) which are 100% carbon and hydrogen), wherein the organic layer is chemically bonded to the surface **10, 30, 32, 38** of the silicon-containing material **12** (col. 2, lines 6-45), and wherein an electrical property of the electrical structure is changed compared to a same substrate without the organic layer, as indicated by Linford (col. 1, lines 21-31; paragraph bridging cols. 8-9; all figures).

For example, Linford states in the paragraph bridging cols. 8-9,

"For example, such molecular layers are suitable for use with: silicon based, micromechanical devices to minimize stiction; **electrode surfaces to optimize their electrochemical properties** for use in **fuel cells** or **electrochemical synthetic cells**; **solar cells as an antioxidation coating**, silicon chips as a monomolecular photoresist, and Si-based chemical sensors to **alter the electrical properties** of the underlying Si." (Emphasis added.)

The word "optimization," by definition, is to improve, and the word "alter" is a synonym of the word "change." Accordingly, Linford expressly and inherently teaches both changing and improving the electrical properties of the semiconductor substrate.

It is seen to be inherent that the organic layer of Linford changes the electrical property of the silicon-containing material, wherein the electrical properties are selected from a group consisting of surface recombination velocity, carrier lifetime, electronic efficiency, voltage, contact resistance, and resistance of a doped region, in addition to those regarding the carrier lifetime. Evidence is the admission of Applicant in the instant specification (for example at p. 7, paragraph 0031 and paragraph 0056, bridging pp. 15-16).



See *In re Swinhart*, 169 USPQ 226,229 (CCPA 1971) (where the Patent Office has reason to believe that a functional limitation asserted to be critical for establishing novelty in the claimed subject matter may, in fact, be an inherent characteristic of the prior art, it possesses the authority to require the applicant to prove that subject matter shown to be in the prior art does not possess the characteristics relied on) and *In re Fitzgerald*, 205 USPQ 594 (CCPA 1980) (the burden of proof can be shifted to the applicant to show that subject matter of the prior art does not possess the characteristic relied on whether the rejection is based on inherency under 35 U.S.C. 102 or obviousness under 35 U.S.C. 103).

Note that as long as there is evidence of record establishing inherency, failure of those skilled in the art to contemporaneously recognize an inherent property, function or ingredient of a prior art reference does not preclude a finding of anticipation. *Atlas Powder Co. v. IRECO, Inc.*, 190 F.3d 1342, 1349, 51 USPQ2d 1943, 1948 (Fed. Cir. 1999). (Two prior art references disclosed blasting compositions containing water-in-oil emulsions with identical ingredients to those claimed, in overlapping ranges with the claimed composition. The only element of the claims arguably not present in the prior art compositions was "sufficient aeration . . . entrapped to enhance sensitivity to a substantial degree." The Federal Circuit found that the emulsions described in both references would inevitably and inherently have "sufficient aeration" to sensitize the compound in the claimed ranges based on the evidence of record (including test data and expert testimony). This finding of inherency was not defeated by the fact that one of the references taught away from air entrapment or purposeful aeration.). See also *In re*

*King*, 801 F.2d 1324, 1327, 231 USPQ 136, 139 (Fed. Cir. 1986); *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 782, 227 USPQ 773, 778 (Fed. Cir. 1985).

In the decision in *Toro Co. v. Deere & Co.*, 69 USPQ2d 1584 (CA FC 2004), at page 1590, last paragraph, it was held that if "one or more embodiments -- whatever the settings of their operational features -- [] necessarily include or result in the subject matter of [the] limitation," then inherent anticipation of the limitation exists.

Claims 13, 16, 21-24, 41, and 49-52 are rejected under 35 U.S.C. 102(b) as being anticipated by the article Bansal et al. (an instant inventor, Nathan S. Lewis being listed as a co-author) "Alkylation of Si surfaces using a two-step halogenation/Grignard route," *Journal of the American Chemical Society*, Vol. 118, 1996, pp. 7225-7226.

Regarding independent claim 13, Bansal discloses a process of forming a semiconductor substrate and the substrate produced thereby comprising, providing a hydrogen-terminated—further limited by claim 41—monocrystalline silicon substrate having a porosity of not more than 30% (nonporous monocrystalline silicon has a porosity of not more than 30%); activating the hydrogen-terminated silicon surface, substantially free of oxidation, by chlorinating the hydrogen-terminated surface—as further limited by instant claims 21 and 22; and reacting the activated silicon surface with an alkyl lithium or Grignard reagent to replace the chlorine atoms of the terminated sites with a monolayer of the alkyl group of the alkyl lithium or Grignard reagent, wherein the exemplary alkyl groups have 1 (methyl), 2 (ethyl), 4 (butyl), 5 (pentyl), 6 (hexyl), 10 (decyl), 12 (dodecyl), or 18 (octadecyl) carbons—as further limited by instant claims 16, 23, 24, and 49-52.

While Bansal does not discuss the electrical properties (such as carrier lifetime) of the alkylated silicon substrate, it is held, absent evidence to the contrary, that the alkylated silicon substrate must have all of the same properties, electrical or otherwise, since the structure is the same as disclosed and claimed, and therefore reads on the properties as claimed in claims 13, and 49-52. (Compare the Bansal method to one of the methods of the instant specification, as recited in paragraphs 0046-0047 and 0066-0070, being claimed by Applicant to give the claimed electrical properties in the alkylated silicon substrate. Applicant's admissions in the instant specification provide additional evidence of inherency.)

In this regard, the following case law is believed relevant. In the decision in *Toro Co. v. Deere & Co.*, 69 USPQ2d 1584 (CA FC 2004), at page 1590, last paragraph, it was held that if “**one or more embodiments**—whatever the settings of their operational features— [] necessarily include or result in the subject matter of [the] limitation,” then inherent anticipation of the limitation exists. (Emphasis added.)

The claiming of a new use, new function, or unknown property that is inherently present in the prior art does not necessarily make the claim patentable. See *In re Best*, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977). Anticipation by a prior art reference **does not require the inventive concept of the claimed subject matter or the recognition of inherent properties that may be possessed by the prior art reference**. See *Verdegaal Bros. Inc. v. Union Oil Co.*, 814 F.2d 628, 633, 2 USPQ2d 1051, 1054 (Fed. Cir.), cert. denied, 484 U.S. 827 (1987). A prior art reference anticipates the subject matter of a claim when the reference discloses every feature of

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the claimed invention, either explicitly or inherently. See *Hazani v. Int'l Trade Comm'n*, 126 F.3d 1473, 1477, 44 USPQ2d 1358, 1351 (Fed. Cir. 1997) and *RCA Corp. v. Applied Digital Data Systems, Inc.*, 730 F.2d 1440, 14.44, 221 USPQ 385, 388 (Fed. Cir. 1984). **The law of anticipation does not require that the reference teach what the appellants are claiming**, but only that the claims on appeal "read on" something disclosed in the reference. See *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 772, 218 CSPQ 781, 789 (Fed. Cir. 1983), cert. denied, 465 U.S. 1026 (1984). Note that as long as there is evidence of record establishing inherency, failure of those skilled in the art to contemporaneously recognize an inherent property, function or ingredient of a prior art reference does not preclude a finding of anticipation. *Atlas Powder Co. vs. IRECO, Inc.*, 190 F.3d 1342, 1349, 51 USPQ2d 1943, 1948 (Fed. Cir. 1999). (Two prior art references disclosed blasting compositions containing water-in-oil emulsions with identical ingredients to those claimed, in overlapping ranges with the claimed composition. The only element of the claims arguably not present in the prior art compositions was "sufficient aeration...entrapped to enhance sensitivity to a substantial degree." The Federal Circuit found that the emulsions described in both references would inevitably and inherently have "sufficient aeration" to sensitize the compound in the claimed ranges based on the evidence of record (including test data and expert testimony). This finding of inherency was not defeated by the fact that one of the references taught away from air entrapment or purposeful aeration.). See also *In re King*, 801 F.2d 1324, 1327, 231 USPQ 136, 139 (Fed. Cir. 1986); *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 782, 227 USPQ 773, 778 (Fed. Cir. 1985).

See *In re Swinhart*, 169 USPQ 226,229 (CCPA 1971) (where the Patent Office has reason to believe that a functional limitation asserted to be critical for establishing novelty in the claimed subject matter may, in fact, be an inherent characteristic of the prior art, it possesses the authority to require the applicant to prove that subject matter shown to be in the prior art does not possess the characteristics relied on) and *In re Fitzgerald*, 205 USPQ 594 (CCPA 1980) (the burden of proof can be shifted to the applicant to show that subject matter of the prior art does not possess the characteristic relied on whether the rejection is based on inherency under 35 U.S.C. 102 or obviousness under 35 U.S.C. 103).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4, 5, and 44-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stengl et al. (U.S. 5,360,759) in view of Linford et al. (U.S. 5,429,708).

Regarding claim 1, Stengl et al. teaches a semiconductor substrate comprising a region of monocrystalline porous silicon-containing material (region 36 in Fig. 4 was epitaxially grown on single-crystal silicon and is therefore itself monocrystalline, and subsequently anodically etched to become porous—column 4, line 97 – column 5, line 45); and an organic layer immediately adjacent to the region of monocrystalline porous

silicon (photoresist mask not shown in Fig. 4; column 5, lines 28-30), bonded to the surface of the silicon-containing material.

Stengl et al. does not specify that the silicon-containing material is substantially free of oxidation. Stengl et al. also does not specify that the organic layer has more than half of its atoms being carbon and hydrogen, or that an electrical property selected from the claimed list is improved as compared to the electrical property of the substrate in the absence of the organic layer.

Linford discloses a semiconductor substrate comprising providing an, *inter alia*, monocrystalline or porous silicon-containing material **12** (col. 1, lines 17-21) having a surface **40** substantially free of oxidation (as shown in Figs. 2A, 2B, 3, etc.; and as stated at col. 2, lines 6-45); and forming an organic monolayer **44**, **45**, **46** having more than half of its atoms being carbon and hydrogen (because R is, *inter alia*, alkyl, alkenyl, aryl, cycloalkyl...." (col. 5, lines 5-13) which are 100% carbon and hydrogen), wherein the organic layer is chemically bonded to the surface **10**, **30**, **32**, **38** of the silicon-containing material **12** (col. 2, lines 6-45), and wherein an electrical property of the electrical structure is altered and/or improved compared to a same substrate without the organic layer, as indicated by Linford (col. 1, lines 21-31; paragraph bridging cols. 8-9; all figures). *Linford additionally teaches that this organic monolayer is suitable for use with silicon chips as a monomolecular photoresist* (sentence bridging columns 8-9).

Therefore, at the time of the invention, it would have been obvious to one of ordinary skill in the art to use the organic monolayer (and the method of applying it—including removing any oxide layer) taught by Linford as the photoresist on the

substrate taught by Stengl et al. It is seen to be inherent that the organic layer of Linford changes the electrical property of the silicon-containing material beneath the organic layer in the resulting structure, wherein the electrical properties are selected from a group consisting of surface recombination velocity, carrier lifetime, electronic efficiency, voltage, contact resistance, and resistance of a doped region, in addition to those regarding the carrier lifetime—further limited by claims 44 and 48. Evidence is the admission of Applicant in the instant specification (for example at p. 7, paragraph 0031 and paragraph 0056, bridging pp. 15-16).

The motivation for doing so at the time of the invention would have been that the organic layer taught by Linford provides a substantial chemical and mechanical barrier, as expressly taught by Linford (column 8, lines 56-63).

Regarding claims 4 and 5, Linford teaches that the organic layer comprises a hydrocarbon (Table 1) and a polymer (Linford claim 32).

Regarding claims 44-47, Linford teaches a methylated surface (col. 8, lines 9-15), an ethylated surface (alkyl with 2 carbons and 5 hydrogens), and a hexylated surface (alkyl with 6 carbons and 13 hydrogens—column 5, line 7).

Regarding claim 48, Linford teaches an alkoxyated surface (col. 4, lines 44-49; Fig. 5).

### ***Response to Amendment***

The declaration under 37 CFR 1.132 filed 2/14/2006 is insufficient to overcome Applicant's anticipated rejection of claim 54, based upon Linford, as suggested in Applicant's remarks dated 2/14/2006.

The declaration does not provide detailed information regarding the nature of the data presented. For example, it is not clear who acquired the data and when, or what type of silicon surface was used. Additionally, it is not entirely clear what quantity was measured—the examiner assumes that “lifetime decay” refers to carrier lifetime. Applicant also does not specify how these measurements were performed, or exactly how the samples were prepared—Applicant states that the silicon surface was modified by a method according to Linford, but does not say how this method differs from the method used to fabricate the substrate claimed in claim 54. Furthermore, claim 54 recites seven electrical properties. Applicant provides data concerning only one of the claimed properties, and does not provide a set of comparison data performed on a substrate in the absence of the organic layer.

For at least these reasons, the examiner is not persuaded by the declaration under 37 CFR 1.132.

It is additionally noted that the same declaration was found insufficient to overcome similar rejections by the former examiner in the Office action dated 9/29/2003.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1, 4, 5, and 44-48 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's primary argument regarding claims 13, 16, 17, 21-27, 41, and 44-53 is that neither Linford et al. nor Bansal et al. teach that the monocrystalline silicon-containing surface has a porosity of not more than 30%. However, Linford et al. and



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Bansal et al. both disclose the use of nonporous silicon, a material that has a porosity of not more than 30%. Independent claim 13 is not currently written to limit the monocrystalline silicon-containing material having a porosity of not more than 30% to porous monocrystalline silicon-containing material.

**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Heather A. Doty, whose telephone number is 571-272-8429. The examiner can normally be reached on M-F, 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr., can be reached at 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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CARL WHITEHEAD, JR.  
SUPERVISORY PATENT EXAMINER  
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